

REMARKS

Reexamination and reconsideration of the present application are requested.

Applicants hereby amend claims 7, 9, 38, 39, 44 and 49, and cancel claims 10, 40, 45 and 46. Accordingly, claims 7-9, 11, 38-39, 41, 43-44, and 47-49 remain pending in the application.

35 U.S.C. § 103

Applicants respectfully submit that all of the now-pending claims 7-9, 11, 38-39, 41, 43-44, and 47-49 are patentable over any combinations of the cited prior art for at least the following reasons.

Claim 7

Among other things, claim 7 has been amended to include features of the now-canceled claim 10, namely, pipes installed outside the processing chamber for providing reaction gases. The pipes include a first pipe having a microwave guide for changing a gas mixture containing a hydrogen gas and a flourine-containing gas in a fixed ratio, or the hydrogen gas only, into a plasma state, and a second pipe for supplying the flourine containing gas into the processing chamber.

The Office Action fairly admits that no such feature is disclosed by either Ballance et al. U.S. Patent 5,444,217 ("Ballance") or Moore et al. U.S. Patent 5,444,217 ("Moore"). However, the Office Action states that such features are disclosed by Shang et al. U.S. Patent 6,182,603 ("Shang") and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ballance's apparatus to include the pipe structure of Shang.

Applicants respectfully disagree.

Unlike the present invention, which pertains to an apparatus for use in removing an oxide layer, both Ballance and Moore pertain to rapid thermal processing (RTP) systems. Neither Ballance's apparatus nor Moore's RTP apparatus "generate plasma in the processing chamber" (Office Action, page 4, line 19) - or anywhere else. Neither Ballance's RTP apparatus nor Moore's RTP apparatus employ a plasma.

There is therefore no motivation to modify Ballance's (or Moore's) RTP apparatus to include "the pipe structure of Shang" as alleged in the Office Action.

There being no motivation or suggestion to one of ordinary skill in the art at the time the invention was made to modify Ballance's RTP apparatus (as modified by Moore) to include the pipe structure of Shang, Applicants respectfully traverse the proposed combination of Ballance and Moore with Shang, and respectfully submit that the amended claim 7 is patentable over any proper combination of the cited prior art.

Moreover, in the apparatus of claim 7, the susceptor is positioned in a lower portion of the process chamber when the reaction gases are supplied onto the wafer, and the susceptor is positioned in the upper portion of the processing chamber when the means for annealing the wafer is operated to anneal the wafer.

None of the cited references disclose or suggest an apparatus including such a feature.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 7 is patentable over the cited prior art.

Claims 9 and 11

Claims 9 and 11 depend from claim 7 and are deemed patentable for at least the reasons set forth above with respect to claim 7.

Claim 38

In similarity to claim 7, the apparatus of claim 38 features: (1) pipes installed outside the processing chamber for providing reaction gases, including a first pipe having a plasma generating device for changing a gas mixture containing a hydrogen gas and a fluorine-containing gas in a fixed ratio, or the hydrogen gas only, into a plasma state, and a second pipe for supplying the fluorine containing gas into the processing chamber; and (2) the susceptor being positioned in the lower portion of the process chamber when the reaction gases are supplied onto the wafer to induce a chemical reaction between the oxide layer and the reaction gases, and being positioned in the upper portion of the processing chamber when the heater is operated

to anneal the wafer. As explained above with respect to claim 7, the cited prior art, taken alone or in combination, does not disclose or suggest any apparatus including either of these features.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 38 is patentable over the cited prior art.

Claims 39, 41 and 43

Claims 39 , 41 and 43 depend from claim 38 and are deemed patentable for at least the reasons set forth above with respect to claim 38.

Claim 44

In similarity to claim 7, the apparatus of claim 44 features: (1) pipes installed outside the processing chamber for providing reaction gases, including a first pipe having a plasma generating device for changing a gas mixture containing a hydrogen gas and a flourine-containing gas in a fixed ratio, or the hydrogen gas only, into a plasma state, and a second pipe for supplying the flourine containing gas into the processing chamber; and (2) the susceptor being positioned in the lower portion of the process chamber when the reaction gases are supplied onto the wafer, and being positioned in the upper portion of the processing chamber when the means for annealing the wafer is operated to anneal the wafer. As explained above with respect to claim 7, the cited prior art, taken alone or in combination, does not disclose or suggest any apparatus including either of these features.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 38 is patentable over the cited prior art.

Claims 47-49

Claims 47-49 depend from claim 44 and are deemed patentable for at least the reasons set forth above with respect to claim 44.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 7-9, 11, 38-


39, 41, 43-44, and 47-49, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS, P.L.L.C.

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By: 
Kenneth D. Springer
Registration No. 39,843

VOLENTINE FRANCOS, P.L.L.C.
12200 Sunrise Valley Drive, Suite 150
Reston, Virginia 20191
Telephone No.: (703) 715-0870
Facsimile No.: (703) 715-0877